

What is claimed is:

1. An ink jet recording head for ejecting ink droplets to print an image, the print head comprising:

a substrate;

an insulating film layer disposed on the substrate;

a plurality of partition walls for defining a plurality of bubbled-ink forming portions, the partition walls being disposed on the insulating film layer along a predetermined, first direction with a predetermined distance between them;

a plurality of heater resistor portions disposed on the insulating film layer within the respective bubbled-ink forming portions, a surface of each heater resistor portion having an oxidation film which is formed by being thermally oxidized and which serves as an ink protection layer, each heater resistor portion being formed by a bubbled-ink forming area for heating and vaporizing ink and by extended portions which are connected to opposite ends, in the first direction, of the bubbled-ink forming area; and

a plurality of pairs of electrodes, each pair of the electrodes being connected to a corresponding heater resistor portion, one electrode of each pair being a first electrode and being disposed at a lower surface side of the insulating film layer, the other electrode of each pair being a second electrode and being disposed on the heater resistor portion,

wherein an upper surface of the insulating film layer is entirely covered with the partition walls and the heater resistor portions such that the upper surface of the insulating film layer is not in direct contact with ink.

2. The ink jet recording head according to claim 1, wherein at least upper surface portions of the insulating film layer, on which upper surface portions the heater resistor

portions are disposed, are flat.

3. The ink jet recording head according to claim 1, wherein the second electrode includes a first terminal and a second terminal, between which the bubbled-ink forming area is positioned when viewed in top plan view, the first terminal being electrically connected to the first electrode.

4. The ink jet recording head according to claim 1, wherein, if the width or length, in the first direction, of each of the first electrodes disposed at the lower surface side of the insulating film layer is defined as W1, the width or length, in the first direction, of the second electrode disposed on the heater resistor portions is defined as W2, and the width or length, in the first direction, of the heater resistor portion is defined as W3, then

$$W2 < W1 < W3.$$

5. The ink jet recording head according to claim 1, wherein the heater resistor portions are formed from TaSiO.

6. The ink jet recording head according to claim 1, further comprising an ejection nozzle including a plurality of nozzles at positions corresponding to the plurality of heater resistor portions.

7. The ink jet recording head according to claim 1, wherein each of the bubbled-ink forming areas is of rectangular shape when viewed in top plan view.

8. The ink jet recording head according to claim 1, wherein, within each of the

bubbled-ink forming portions, the first terminal and the second terminal are separated from one another in a direction substantially perpendicular to the first direction.

9. The ink jet recording head according to claim 1, wherein each of the first electrode is negative and each of the second electrode is positive.

10. The ink jet recording head according to claim 1, further comprising another insulating film layer, which is disposed between the insulating film layer and the substrate.

11. The ink jet recording head according to claim 10, wherein the first electrodes are disposed between the insulating film layer and the another insulating film layer.

12. An ink jet recording apparatus which is provided with an ink jet recording head for ejecting ink droplets to print an image, the ink jet recording head comprising:

- a substrate;

- an insulating film layer disposed on the substrate;

- a plurality of partition walls for defining a plurality of bubbled-ink forming portions, the partition walls being disposed on the insulating film layer along a predetermined, first direction with a predetermined distance between them;

- a plurality of heater resistor portions disposed on the insulating film layer within the respective bubbled-ink forming portions, a surface of each heater resistor portion having an oxidation film which is formed by being thermally oxidized and which serves as an ink protection layer, each heater resistor portion being formed by a bubbled-ink forming area for heating and vaporizing ink and by extended portions which are connected to

opposite ends, in the first direction, of the bubbled-ink forming area;

a plurality of pairs of electrodes, each pair of the electrodes being connected to a corresponding heater resistor portion, one electrode of each pair being a first electrode and being disposed at a lower surface side of the insulating film layer, the other electrode of each pair being a second electrode and being disposed on the heater resistor portion, the second electrode including a first terminal and a second terminal, between which the bubbled-ink forming area is positioned when viewed in top plan view, the first terminal being electrically connected to the first electrode; and

an ejection nozzle including a plurality of nozzles at positions corresponding to the plurality of heater resistor portions,

wherein an upper surface of the insulating film layer is entirely covered with the partition walls and the heater resistor portions such that the upper surface of the insulating film layer is not in direct contact with ink.